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Visualizing and Understanding Convolutional Networks

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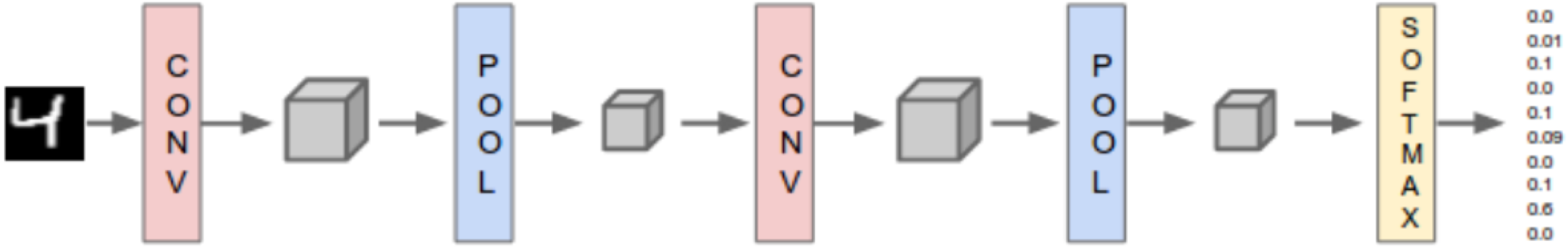

?still little insight into the internal operation and behavior of the model

Visualizing ConvNet!

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Learn from the paper

1.CNN的每一层输出的Map学习到了什么东西
2.通过反卷积网络方法，从可视化角度深入理解CNN
3.make more smaller filter and more deeper network

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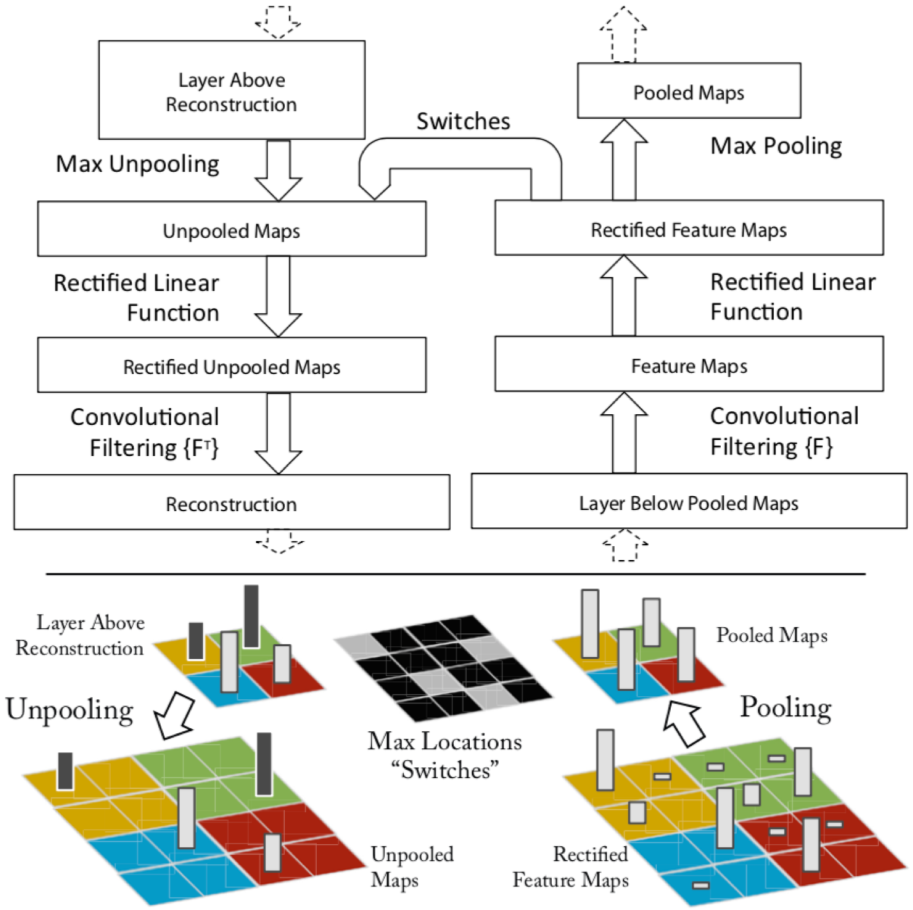
Visualization with a Deconvnet(反卷积网络)



- 将中间特征层的输出映射到原始输入的空间上

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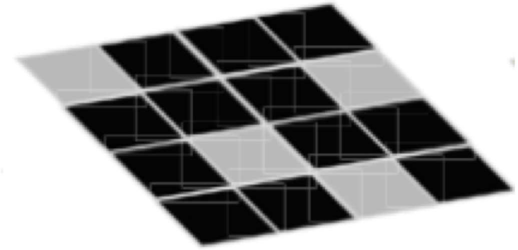
Visualization with a Deconvnet



- Unpooling：近似对maxpooling取逆
- Rectification ：relu （positive）
- Filtering： （ deconvnet，transposed versions of the same filters ）

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Feature Visualization

- Layer12:corners and edge/color conjunctions
- Layer3:complex invariances, textures
- Layer4:significant variation, more class-specific
- Layer5:entire objects with significant pose variation

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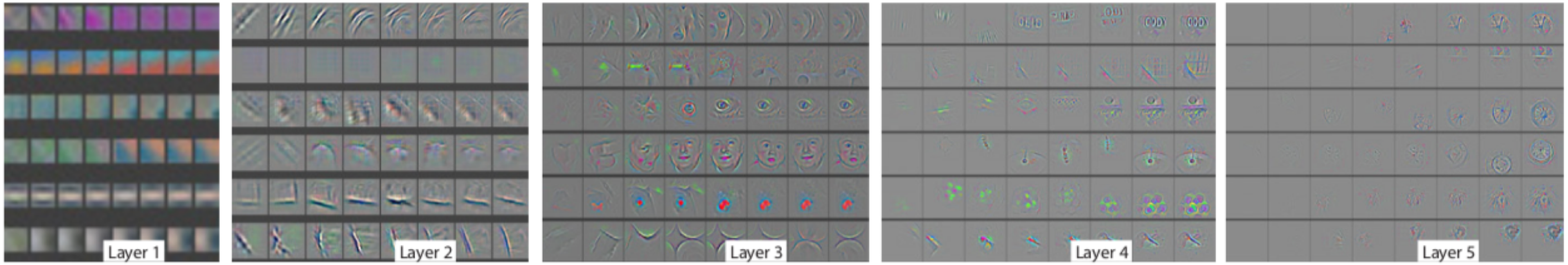
Feature Evolution during Training



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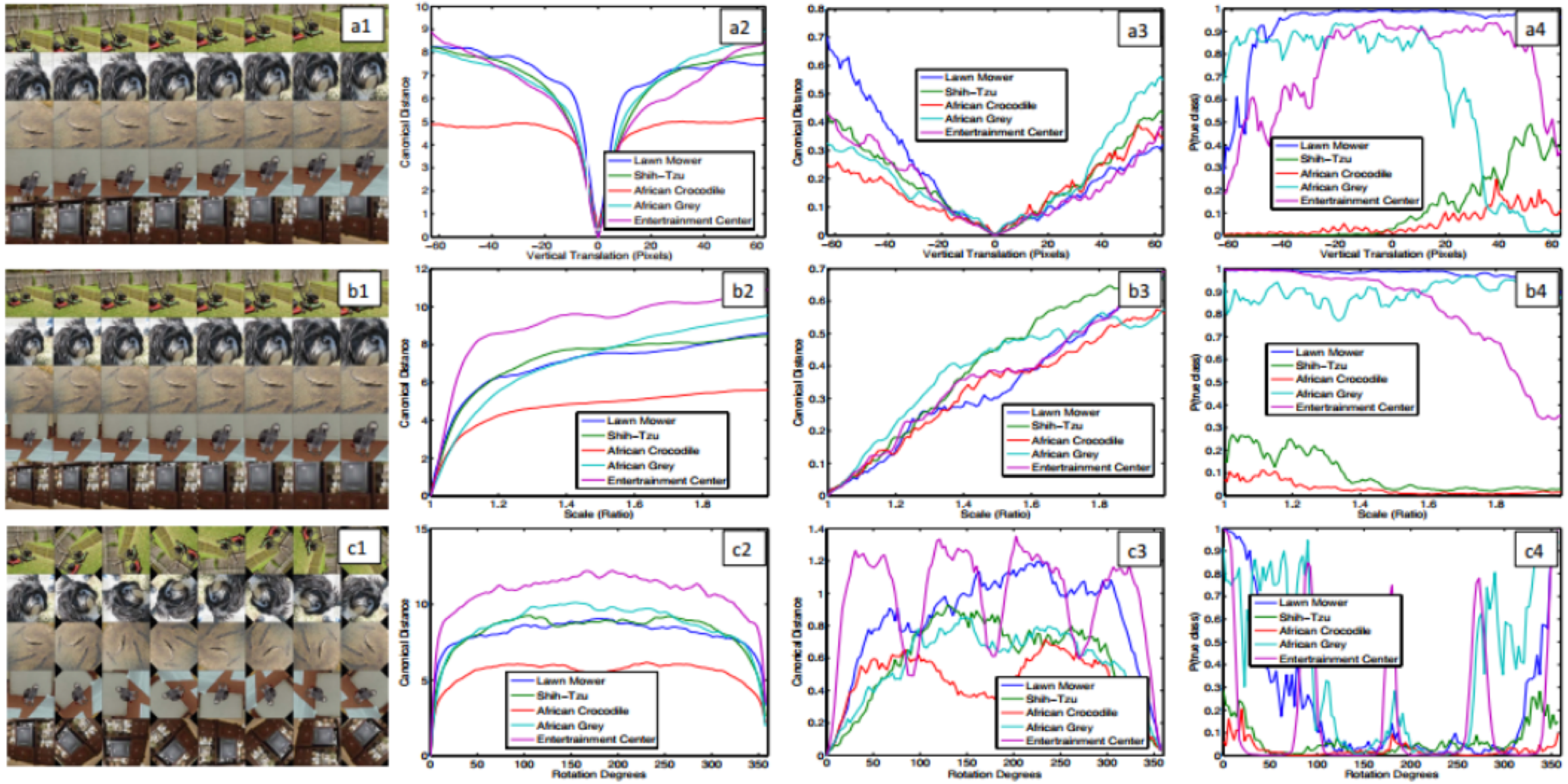
Feature invariance



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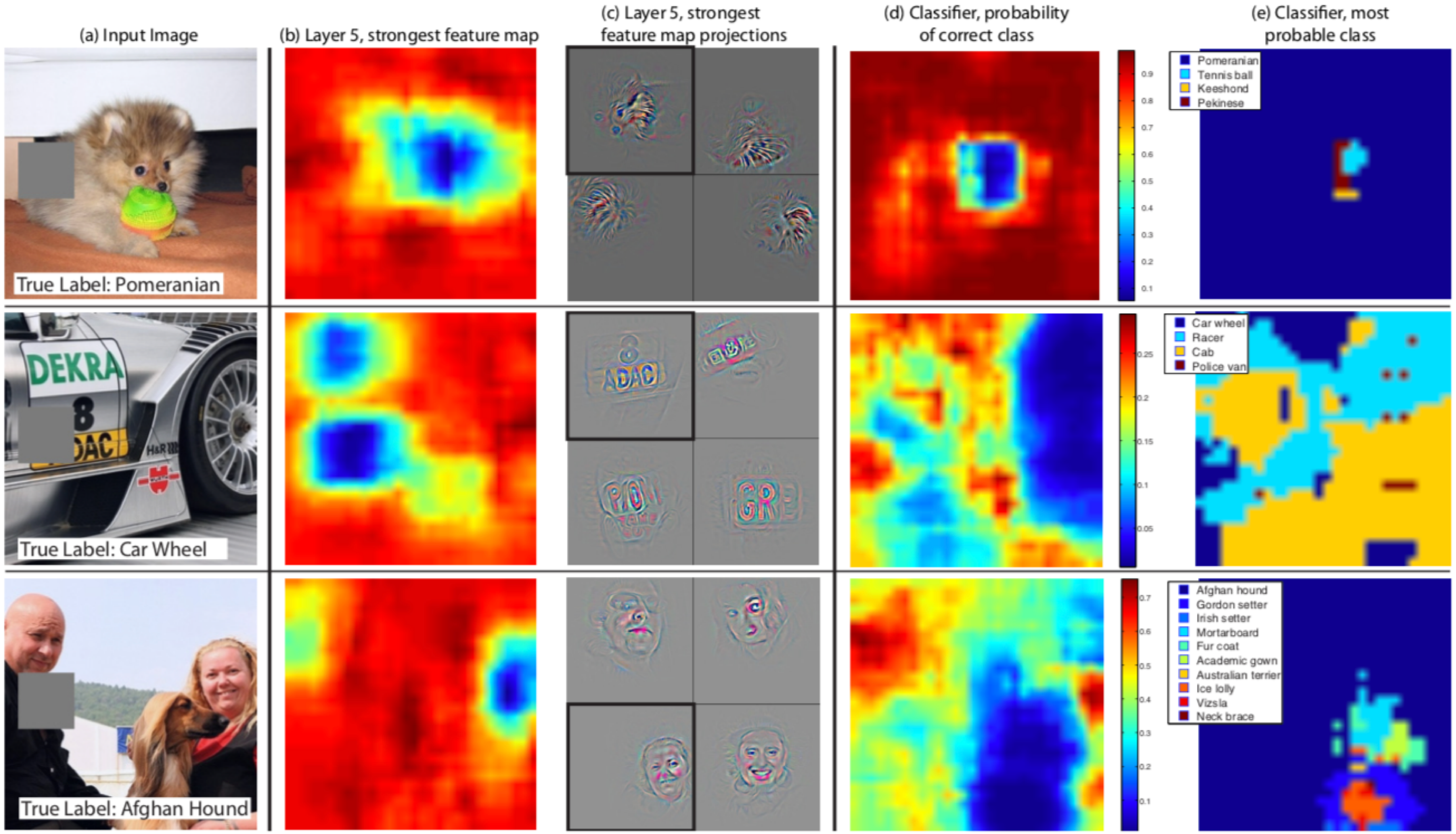
Occlusion Sensitivity



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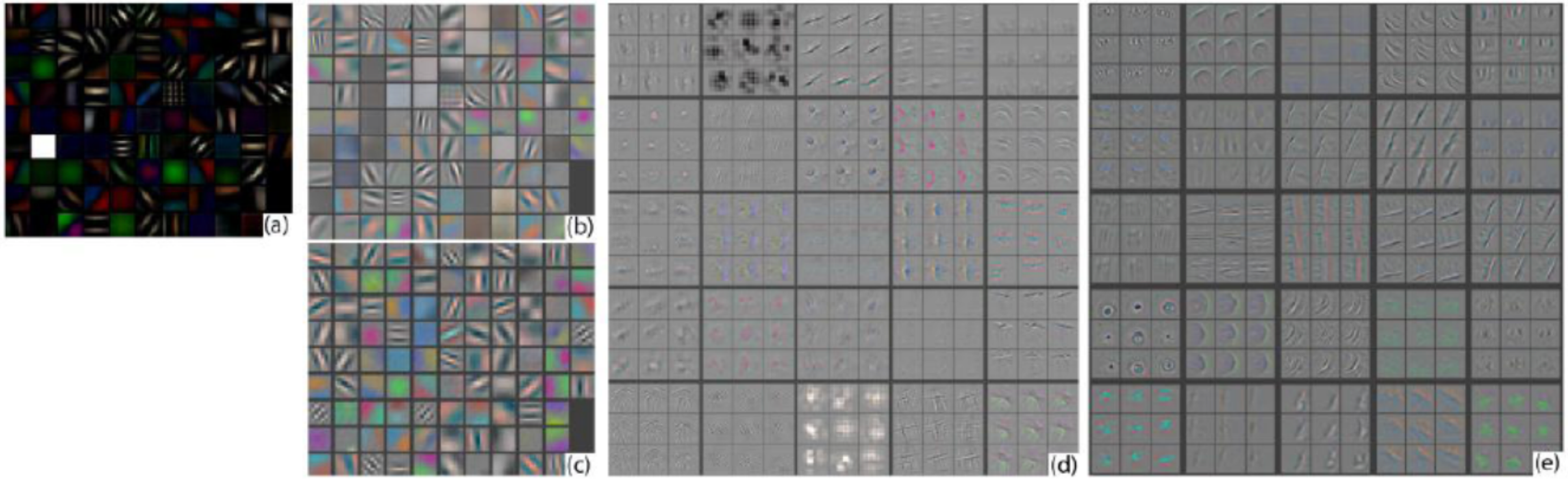
Architecture Selection



- reduced the 1st layer filter size from 11x11 to 7x7
- made the stride of the convolution 2, rather than 4

- THANKS